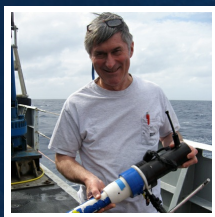


Assessing Ecosystem Health through Chemistry



George Luther

Maxwell P. and Mildred H. Harrington Professor, School of Marine Science and Policy

CURRENT RESEARCH

Exploring the interaction of chemistry and (micro)biology at interfaces

Massive fish kills all over the east coast of the US as well as the Gulf Coast, are usually due to one of two factors: low oxygen or hydrogen sulfide. Toxic and corrosive, hydrogen sulfide in bottom stagnant waters, that also contain ammonium and phosphate and that can overturn during storm events, often result in fish kills and in harmful algal blooms. Dr. George Luther, Maxwell P. and Mildred H. Harrington Professor at the University of Delaware, documents the chemistry and biology of many different natural systems including stagnant basins, oxygen minimum zones, sediments, and hydrothermal vents. For example, Dr. Luther and his group discovered that adding compressed air to the intake of a hydroelectric power plant rapidly oxidized bottom water sulfide (in the presence of iron), so that the water placed back into the environment did not release hydrogen sulfide to the atmosphere due to oxidation of sulfide. By probing the chemistry of interfaces in the sediments and in the water column where oxygen, manganese, iron and sulfide interact including biological and chemical rates of reaction, Dr. Luther is able to offer solutions to remediate sediments.

Dr. Luther takes a physical inorganic chemistry approach to understand environmental problems of importance and relevance, engaging disciplines across geology, geochemistry, and (micro)biology to answer important long-standing questions about the environmental chemistry of multiple elements and the health of an ecosystem. His group has also developed a multi-analyte electrode sensor to measure various chemical species of oxygen, sulfur, iron and manganese simultaneously and in real time. Although they are at a very mature stage in their research, Dr. Luther and...

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AFFILIATION



University of Delaware

EDUCATION

- Ph.D. in Physical-Inorganic Chemistry 1972, University of Pittsburgh
- B.A. in Chemistry 1968, La Salle College

AWARDS

- Fellow of the Geochemical Society / European Association of Geochemistry, 2014
- University of Pittsburgh Department of Chemistry and Biochemistry Alumni Awardee, 2014
- American Chemical Society (ACS) Geochemistry Division Medalist, 2013
- Fellow of the American Geophysical Union (AGU), 2012
- Fellow of the American Association for the Advancement of Science (AAAS), 2011

RESEARCH AREAS

Environment, Ecology, Oceanic

FUNDING REQUEST

Your contributions will support the continued research of Dr. George Luther as he assesses the health of ecosystems including those impacted by human activities using *in situ* electrochemical sensors that detect several chemical species simultaneously. Donations will help fund the \$200-250K/year required to support a postdoctoral student and one Ph.D. graduate student, along with supplies, equipment, and travel for fieldwork and conferences. Partner with Dr. Luther as he derives solutions to enhance the environment!